REMARKS

Claims 1-48 were pending. Claims 1, 9-12, 23, 25, 33-37 and 47 have been amended. Claims 2, 26 and 41 have been cancelled. Claims 1, 3-25, 27-40 and 42-48 are now pending, of which claims 1 and 25 are independent. Reconsideration of the action mailed February 25, 2004, is requested in light of the foregoing amendments and the following remarks.

The Examiner rejected claims 1-14, 17-21, 23-38, 41-45, 47, and 48 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,963,664 A ("Kumar") in view of U.S. Patent No. 6,078, 701 A ("Hsu"). The Examiner rejected claims 15 and 39 under 35 U.S.C. § 103(a) as being unpatentable over Kumar in view of Hsu and further in view of U.S. Patent No. 4,057,338 A ("Yevick"). The Examiner rejected claims 16 and 40 under 35 U.S.C. § 103(a) as being unpatentable over Kumar in view of Hsu and further in view of U.S. Patent No. 5,802,202 A ("Yamada"). The Examiner rejected claims 22 and 46 under 35 U.S.C. § 103(a) as being unpatentable over Kumar in view of Hsu and further in view of U.S. Patent No. 5,838,837 ("Hirosawa").

SECTION 103(a) REJECTIONS

Claim 1 stands rejected as unpatentable over Kumar in view of Hsu. Claim 1, as amended, recites "using the first corrected shape to determine a focal length and rotation angles of a camera associated with the first image." Neither Kumar nor Hsu disclose or suggest using the first corrected shape to determine a focal length and rotation angles of a camera associated with the first image.

The Examiner looks to Kumar as disclosing the calculation of a focal length based on a first corrected shape of a first image at col. 4, lines 51-53, and col. 5, lines 52-62. Col. 4, lines 45-55 disclose that a parallax field can be used with a parametric surface and planar motion field to reconstruct a three-dimensional scene. In col. 4, lines 51-53, Kumar discloses that when camera parameters, such as a focal length, are known, then the reconstructed three-dimensional scene is Euclidian. Specifically, col. 4, lines 51-53 reads: "If camera calibration parameters such as focal length and optical center are known, then this three-dimensional reconstruction of the scene is Euclidean." There is no disclosure of calculating the focal length. The cited section,

instead, simply indicates a quality of the reconstructed scene when the camera properties are known.

In col. 5, lines 38-62, Kumar discloses a technique for mapping a point in a reference camera coordinate system with a point in an inspection camera coordinate system. Col. 5, lines 52-62 reads: "Using perspective projection, the image coordinates (x,y) of a projected point P are given by the vector p of Equation 2. [Equation 2] where f is the focal length of the camera." Specifically, the cited lines 52-62 describe a vector for determining image coordinates where the vector is solved using Equation 2. Equation 2 shows that the vector (p) includes a focal length of a camera as a variable. However, the use of a focal length to solve the equation does not show that Kumar calculates the focal length since Kumar is not using Equation 2 to solve for the focal length; the focal length is simply an input variable. Additionally, even if Equation 2 did solve for the focal length, Equation 2 does not solve for the focal length using a first corrected shape of a first corrected image as required by claim 1.

Furthermore, the Examiner states on page 5, line 1 of the Detailed Action that Kumar shows "the focal length of a camera is predetermined." While a camera may have a predetermined focal length, the focal length is not necessarily known. Kumar does not disclose using the first corrected shape to determine a focal length of a camera associated with the first image.

In addition, Kumar does not disclose using the first corrected shape to determine rotation angles of a camera associated with the first image. The Examiner looks to col. 8, line 35 and col. 7, Equation 5 as disclosing the selection of rotational angles. At col. 8, line 35, Kumar states that some initial parameter values can be selected. The eight parameter values, defined in col. 7, Equation 5, are parameters for determining the motion field of a planar surface. The Examiner states that "Ω" in Equation 5 represents the rotation angles of a camera. However, Ω does not represent the rotation angles of a camera. Instead, according to Kumar, "Ωx, Ωy and Ωz denotes [sic] the angular-velocity vector." *See* col. 7, line 39. An angular-velocity vector is not a rotation angle of a camera. Kumar does not disclose using the first corrected shape to determine rotation angles of a camera associated with the first image.

Finally, the Examiner does not assert that Hsu discloses using the first corrected shape to determine a focal length and rotation angles of a camera associated with the first image. For at least the foregoing reasons, Applicant respectfully submits that claim 1, as well as claims 2-24, which depend from claim 1, are in condition for allowance.

Claim 9 stands rejected as unpatentable over Kumar in view of Hsu. Claim 9, as amended, recites "using the second corrected shape to determine a focal length and rotation angles of a camera associated with the second image." For at least the reasons set forth with respect to claim 1, claim 9 is also in condition for allowance.

Claim 10 stands rejected as unpatentable over Kumar in view of Hsu. Claim 10, as amended, recites "adjusting the selected values of the rotation angles and the focal length based on a difference between the estimated shape and the actual shape of the perimeter of the corrected version of the first image."

The Examiner asserts that col. 8, Equation 8 of Kumar as disclosing the recited element of claim 10. Equation 8 is described with respect to determining a motion field used to align images. *See* col. 7, line 60 to col. 8, line 20. Equation 8 is an "error measure for estimating the flow field within an image region." *See* col. 8, lines 8-9. Equation 8 includes an image velocity at a point within an image region and a motion field within the region. *See* col. 8, lines 14-19. Kumar does not disclose adjusting rotational angles and focal length using Equation 8. Neither Kumar nor Hsu disclose adjusting rotational angles and focal length using a difference between an estimated shape and an actual shape of a perimeter of a corrected version of an image. For at least the foregoing additional reasons, claim 10, as well as claims 11-12 and 14-16, which depend from claim 10, are in condition for allowance.

Claim 25 stands rejected as unpatentable over Kumar in view of Hsu. Claim 25, as amended, recites "use the first corrected shape to determine a focal length and rotation angles of a camera associated with the first image." For at least the same reasons set forth with respect to claim 1, claim 25, as well as claims 27-40 and 42-48, which depend from claim 25, are also in condition for allowance.

Claim 34 stands rejected as unpatentable over Kumar in view of Hsu. Claim 34, as amended, recites "adjusting the selected values of the rotation angles and the focal length based on a difference between the estimated shape and the actual shape of the perimeter of the corrected version of the first image." For at least the reasons set forth with respect to claim 10, claim 34, as well as claims 35-36 and 38-40, which depend from claim 34, are in condition for allowance.

Applicant respectfully requests that all pending claims be allowed. Please apply any charges or credits to deposit account 06-1050.
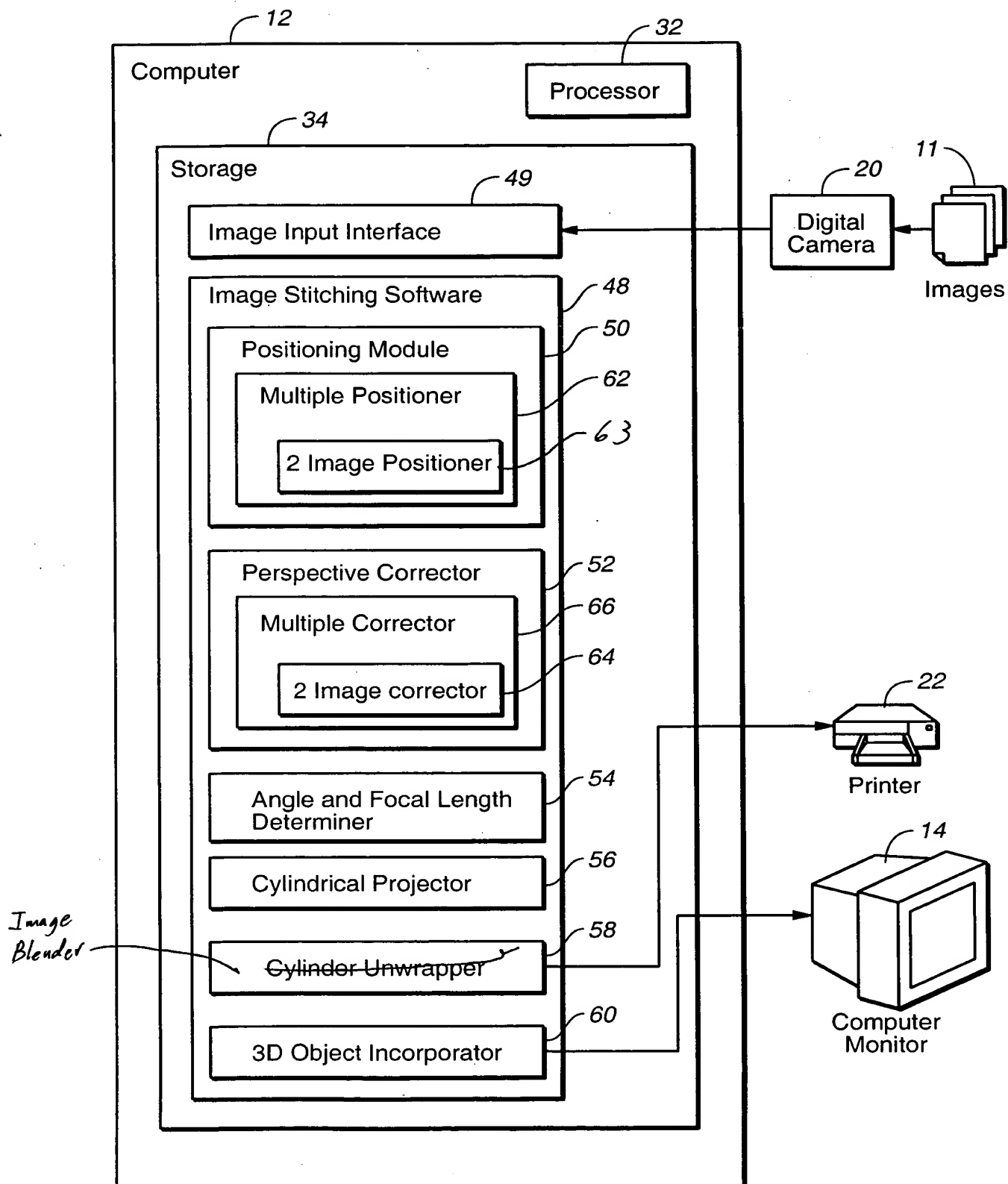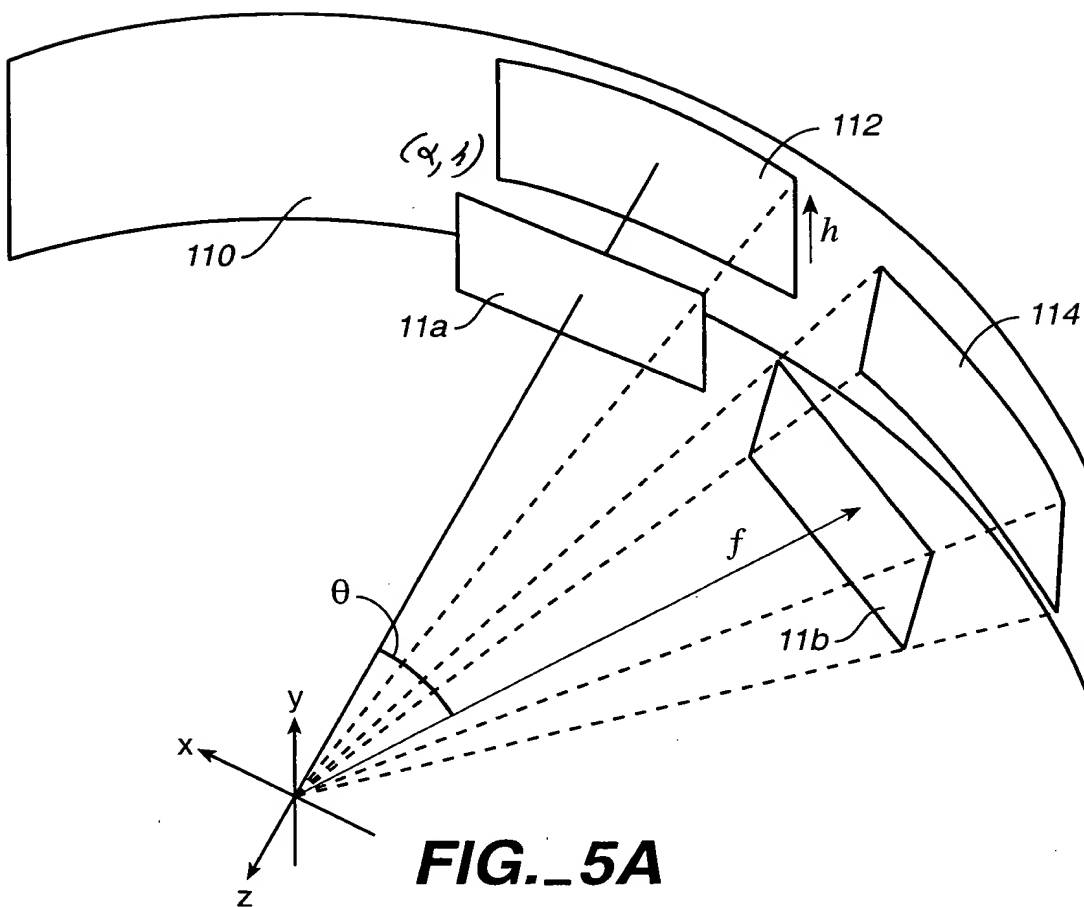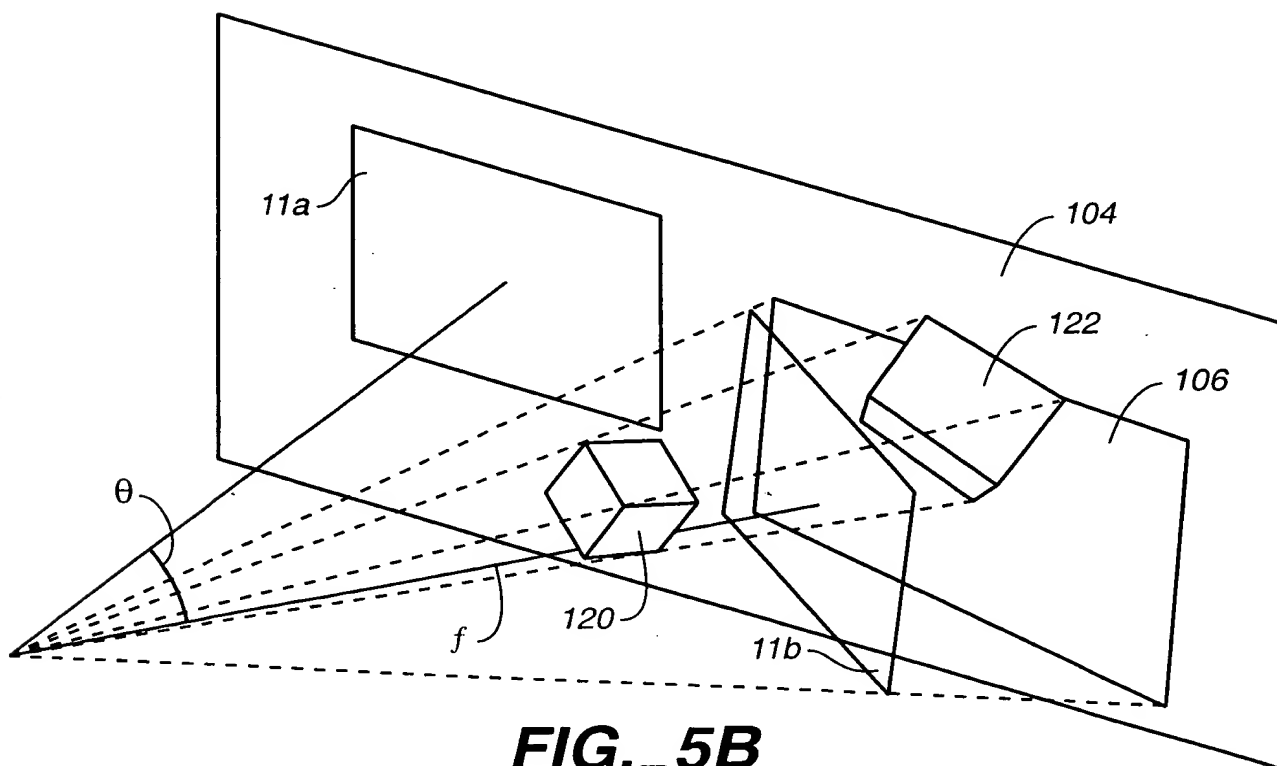
Respectfully submitted,

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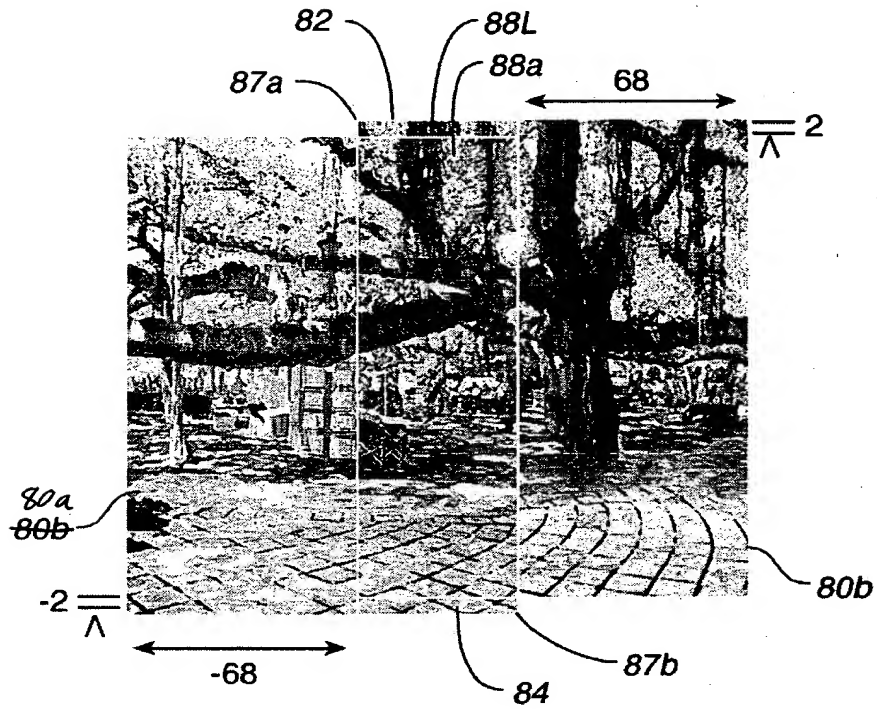Telephone: (650) 839-5070
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FIG._1

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FIG._5A

FIG._5B

FIG._6A

FIG._6F